Stacy Alaimo

MCS Matters: Material Agency in the Science and Practices of Environmental Illness

ABSTRACT

If nature is to matter, we need more potent, more complex understandings of materiality. New conceptions of materiality, which are neither biologically reductive nor strictly social constructionist, are emerging in science studies, environmental philosophy, corporeal feminism, disability studies and other fields. This essay analyzes scientific, popular and autobiographical accounts of multiple chemical sensitivity (MCS), or environmental illness, arguing that this condition provokes new models of material agency as well as new forms of environmentalism. The material agency of MCS epitomizes "trans-corporeality"—the recognition that the substance of the human is co-extensive with the emergent, more-than-human world.

RÉSUMÉ

Si la nature compte, alors nous devons nous efforcer de comprendre plus profondément les complexités du monde matériel. De nouvelles conceptions de la matérialité, qui ne se réduisent pas à la biologie ni à un strict constructivisme social, font leur apparition dans les études scientifiques, la philosophie environ-

nementale, le féminisme corporel, les études du handicap et d'autres domaines. Cet article analyse des comptes rendus scientifiques, populaires et autobiographiques de sensibilités multiples aux agents chimiques (*multiple chemical sensitivity* – MCS), soit les maladies environnementales, en avançant que cette condition suscite de nouveaux modèles d'agir matériel autant que de nouvelles formes d'environnementalisme. L'agir matériel des MCS incarne une forme de « trans-corporalité » – une manière de reconnaître que la substance de l'humain est corrélée au monde plus qu'humain en émergence.

> Matter is not little bits of Nature, or a blank slate, surface, or site passively awaiting signification, nor is it an uncontested ground for scientific, feminist, or Marxist theories. (Barad 2001: 88)

> And the word *environment.* Such a bloodless word. A flat-footed word with a shrunken heart. A word increasingly disengaged from its association with the natural world. Urban planners, industrialists, economists, developers use it. It's a lost word, really. A cold word, mechanistic, suited strangely to the coldness generally felt toward nature. (Williams 2002: 5)

¤

Karen Barad and Joy Williams alert us to the rather shabby theoretical and rhetorical treatment of matter and environment in the late 20th century. Matter, the very substance of the world, the very stuff of ourselves, has been subdivided into manageable bits or flattened into a blank slate for human inscription. The environment has been drained of its blood, its liveliness, its agency, its ecologies and its creatures—in short, all that is recognizable as "nature"—in order that it become a mere empty space, an uncontested ground for human development. The target of Barad's critique is the linguistic turn within theory, especially feminist theory, but when put next to Williams's critique of the word "environment," a troubling parallel arises between predominant theoretical conceptions of matter and a much wider disregard for the value of non-human nature. The provocative title of this issue—"Nature Matters"—challenges us to consider not only whether nature does in fact matter, but whether our conceptions of matter affect environmental ethics and politics.

If nature is to matter, we need more potent, more complex understandings of materiality itself. New conceptions of materiality, which are neither biologically reductive nor strictly social constructionist, are emerging in many disciplines such as science studies, environmental philosophy, corporeal feminism, disability studies, new media studies, race theory and other areas.[1] This new materialism insists upon the agency, semiotic force and consequence of materiality. Science studies scholars such as Donna Haraway, Karen Barad, Elizabeth Wilson, Nancy Tuana, Andrew Pickering and others forge modes of analysis that do not bracket

or diminish materiality but instead create frameworks in which nature, culture, materiality and discourse inter- or intra-act.[2]

Departing from a long tradition in feminist theory of distancing "woman" from both nature and corporeality, I propose that feminism and environmentalism inhabit a transcorporeal space in which the human body and the wider physical environment interconnect. The movement across human corporeality and non-human nature necessitates rich modes of analysis that travel through entangled territories: material and discursive, natural and cultural, biological and textual. Because we dwell at the interface between human bodies and more-than-human natures, we must pay attention to materiality as such—as forces and substances that act, react and intra-act, reshaping human bodies and minds. I would like to grapple with the ways in which environmental ethics, social theories, scientific accounts, popular understandings of science and conceptions of the human self are profoundly altered by the recognition that the environment is not located somewhere out there, but is always as close as one's own skin. Transcorporeality renders it impossible to imagine nature as a blank, passive, resource for active human subjects who are securely distinct from the material world. Starting with contemporary toxic bodies, for example, rather than with Humanist selves, forces us to imagine ourselves in constant interchange with the environment, which means in part reckoning with the unpredictable agencies of xenobiotic chemicals. Most dramatically, perhaps, those who live with a condition known as multiple chemical sensitivity, or MCS, experience their environments not as inert backgrounds but as intimate though insidious surroundings.

MCS, also known as environmental illness, or EI, is a condition in which exposure to everyday 20th-century environments or substances causes a range of reactions, including skin rashes, tremors, convulsions, breathing difficulties, headaches, dizziness, nausea, joint pain, "brain fog" and extreme fatigue. The scientific, medical and popular accounts of this syndrome vary tremendously—minoritizing accounts see it as a distinct illness, whereas universalizing accounts see it as something that afflicts us all in various degrees. Some believe it is related to or overlaps with, cancer, autoimmune diseases and other diseases, while others dismiss it outright as a psychosomatic, hysterical condition. There is no standard medical test for MCS/EI, nor even an established definition. Various experts cited in Peter Radetsky's *Allergic to the Twentieth Century* (1997) posit that EI is caused by the trigeminal nerve, the limbic system, allergic reactions to chemicals, a state of immune system disregulation or a disturbance of cholinergic processes in the brain. Most provocatively, Radestky cites one scientist, Claudia Miller, who claims that "toxin-induced loss of tolerance" (TILT) may well be an entirely new category of diseases (in the plural) on par with that of infectious diseases. If that were the case, one would imagine scientists would be eager to investigate this unknown territory. There has been no mad rush of medical research, however. William Rea, MD, an expert on MCS, argues that "the major stumbling block in

recognizing the etiology of chemical sensitivity ... has been the general failure of the medical profession to appreciate the massive increase in and adverse effects of exposure to environmental pollution" (Rea 1992: 8).

As for the treatment of this condition, nearly all the EI patients and the clinicians who work with them agree: the best practice is to avoid offending substances. This approach requires no drugs, no surgery and no hospital stay—in fact, each of these standard medical treatments would only increase the patient's "toxic load."[3] And yet, avoidance is no simple matter. Since ordinary things such as pesticides, perfume, vehicle emissions, fabric softeners, magazines and carpeting may trigger symptoms, MCS demands a thorough overhaul of nearly all military, industrial, manufacturing, agricultural, domestic and consumer practices. As Radetsky contends, a "disease based on the contention that chemicals are bad for us threatens to unravel the fabric of our civilization—and the enormous profits gleaned from it" (1997: 167). Or, as Steve Kroll-Smith and H. Hugh Floyd put it, MCS may be nothing less than a "somatic indictment of modernity" (1997: xi). Perhaps that is one of the reasons MCS, which has a prevalence "roughly similar to that of diabetes and glucose intolerance," receives "less than a thousandth" of the funding given for diabetes research (Pall 2002: 11).

As a radical challenge to business as usual and as a corporeal condition that does not fit into existing medical models, EI presents potent possibilities for rethinking both the boundaries of human bodies and the territory of health. Susan Sontag has urged us to avoid using illness as a metaphor because "the most truthful way of regarding illness—and the healthiest way of being ill—is one most purified of, most resistant to, metaphoric thinking" (1977: 3). Whereas Sontag would like us to peel off the cultural overlay of metaphor to see the reality of disease, I propose that we dwell on the possibilities for a metonymic slide, a chain of material significations in which environmental illness extends the body outwards, into a transcorporeal space. Such a body (or mind) cannot be severed from that which surrounds it since multiple material substances provoke pain, illness, confusion and fatigue. As Kroll-Smith and Floyd put it, a "person with MCS examines points of intersection between her body and those places and things it is encountering. She is interested in the surface of her body and its points of contact with material culture" (Kroll-Smith and Floyd 1997: 104). Rhonda Zwillinger's (1998) collection of photos of people with MCS captures this sense of transcorporeality by creating portraits that merge person, domestic space and environment. Thus, environmental illness offers a particularly potent example of transcorporeal space in which the human body can never be disentangled from the material world—a world of emergent, entangled biological creatures as well as a multitude of xenobiotic, human-made substances.

Oddly, whereas scientists debate whether MCS is a physical or a mental phenomenon, and thus whether it is material or immaterial, social theorists whose

work is immersed in models of social construction become compelled by MCS to formulate models of material agency and corporeal modes of knowing. Furthermore, people with MCS must themselves continually negotiate the material agencies of every place, every stream of air, every food and personal care product that they encounter. Phenomena that most people experience as inert and benign make themselves known to people with MCS in vivid and undeniable ways. Thus, understanding MCS requires new models of material agency, as well as new epistemological, ethical and political strategies. MCS expands the boundaries of "health" well beyond the domain of conventional medicine, as the human body and the material environment become coextensive. Above all, environmental illness demands material practices that deviate from business as usual in our early 21st-century chemical-industrial society.

Portraits of the Body-Space of Environmental Illness

Environmental illness erodes the commonsensical outlines of the human body, as people become vulnerable to things that were formerly considered discrete, utilitarian objects—a gas stove, a couch, a shower curtain. Suddenly, these things are no longer inert, but interact with one's body, causing particular symptoms. Furniture made of particleboard, for example, may steadily release formaldehyde. (This may sound paranoid, crazy, or comical, especially since it evokes the B-movie-horror in which something benign becomes a killer: The Couch that Devoured Manhattan!) Even as it is standard medical practice to breech corporeal boundaries with surgery, injections, transplants, dialysis and other procedures, rarely does the medical model picture the human body as coextensive with its environment or vulnerable to ostensibly inert objects such as carpets or couches. And yet, those with EI experience their contiguity with the material world and thus cannot be assured that anything is or will remain external. One psychiatric study, ironically, in the *Journal of Nervous and Mental Disease*, accounts for the phenomena of MCS by labelling the chemically reactive as "externalizers" with "low private self attentiveness." Constanze Hausteiner and his co-authors argue that these "'externalizers' could benefit from an intervention that teaches them to focus on their internal and emotional lives" (Hausteiner et al. 2003: 50). This "treatment" assumes that the healthy self is a rigidly enclosed non-material entity. Indeed, Haustenier et al. partition corporeal experience from the self when they suggest that the "external attribution in EI might be reflected by a generally low self-attentiveness in contrast to the overestimation of physical sensations" (Hausteiner et al. 2003: 50). Moreover, by fixing the blame on an individual's psyche, the treatment absolves government, industry and the entire industrial-political world. By contrast, a forty-six-page report published in the *Journal of Nutritional and Environmental Medicine* concludes with a list of government recommendations (for the U.K.), that aim to decrease the population's exposure to xenobiotic chemicals (Eaton et al. 2000). Rather than placing the onus upon

individuals, this report insists that "individuals currently cannot choose to avoid chemical exposures, and even reducing them is both expensive and socially isolating" (27). The permeable self that these authors refer to is enmeshed in a political-material world that cannot easily be navigated. Similarly, Janice Strubbe Wittenberg's book, *The Rebellious Body: Reclaim Your Life from Environmental Illness and Chronic Fatigue Syndrome* (1996), asserts that "EI and CFS are symbols for what can happen when you take the world into your body" (274). These symbols may be more accurately described as ingrained material metonyms, since EI literally results from "taking the world into your body." Seeing these illnesses as transcorporeal animates a self-help book in which political activism and personal healing are symbiotic. Strubbe Wittenberg, a registered nurse, advises people to undertake activism, which includes healing oneself, educating oneself, engaging in green consumerism, voting for environmentally oriented politicians and writing letters to the U.S. Congress.

Rhonda Zwillinger's photographs in *The Dispossessed* (1998) display the devastation wrought by extreme forms of MCS. In "The Enfreakment of Photography" David Heavey argues that "the photographic observation of disablement has increasingly become the art of categorization and surveillance" (Heavey 1997: 36). Zwillinger's photos, however, emphasize the ongoing necessity for particular forms of identity politics—which, of course, can be a form of categorization of people who live with an illness that many dismiss as nonexistent. For example, Eriksen and Ursin, in the *Journal for Psychosomatic Research*, dismiss MCS and other complaints because "[t]here seem to be no sharp lines between what is a completely normal phenomenon, ignored by most people, and crippling conditions that require support, treatment, and can lead to disability" (1994: 445). Zwillinger, who herself has MCS, must somehow visually represent the serious impact of this condition without posing the subjects as spectacles.

Strikingly, unlike conventional portraits, here the background comes into the foreground and the subject seems rather marginal. Sometimes an air mask obscures the subject's face. Even when the face is visible, its expression reveals little about that person's interior life. These photos do not answer the question "who is this person," but rather "how does this person manage to live?" These are not portraits of individuals so much as human-landscapes in which the person, the domestic sphere and the environment are coextensive. In one photo, for example, the subject is hardly visible at all as she sits within a dark sauna in the background. On the next page, a couple clad in white sit on white sheets, against white walls, blending in to their home. Many of the photos confound distinctions between inside and outside, nature and domestic space as they depict a mattress placed outside, or a jumble of personal belongings huddled under a carport, or the many tents, automobiles and trailers that serve as makeshift domestic space, floating within the expanse of an Arizona desert.

The vivid photos of people inhabiting these deviant spaces conjure what cannot be seen: the pernicious spaces of regular human habitation riddled with toxic emissions from things as air fresheners, pesticides, perfumes, fabric softeners, cosmetics, paints, gas stoves, upholstery, shower curtains, clothing and chlorinated water. The photographs function as an anti-spectacle, dispersing the surprise of the "deviant" to the "normal," asking us to see, smell or imagine the invisible toxins that permeate everyday life. Thus, Zwillinger's photos of the living spaces of those with MCS ultimately question the safety of standard, early 21st-century human habitats. The deviant spaces she represents retain their political bite, as they insist upon the permeable boundaries of the individual.

Whereas medical models of bounded human bodies make no sense for EI, since the body is not separable from its environment, disability models of accessibility may provide a productive avenue of approach. Eliminating air fresheners, scented soaps, toxic cleaning products and pesticides from public places would be inexpensive and simple ways to make these places less harmful for the chemically reactive. Significantly, as science debates the existence of EI, and medicine generally dismisses it, disability law has welcomed it. Kroll-Smith and Floyd claim that because "the issue of disabilities attends to functions and not cause," the chemically reactive are gaining more recognition from the legal system than the medical system (1997: 165). Making public spaces accessible for the chemically sensitive would benefit everyone, since many of the substances that affect people with MCS are also carcinogens. Thus, the minoritizing, or disability model, which exhibits the most severe cases of MCS, can be complemented by broader, universalizing models in which the ubiquitous xenobiotics of the 21st century threaten us all. Even such universalizing arguments, however, are ultimately too humanist to account for the traffic in toxins that ravages not only people but also animals, plants and entire ecosystems. Thus, MCS, or more appropriately in this context, environmental illness, needs to be allied not only with the disability rights movement, but with anti-toxin, environmental and environmental justice movements in order to forge an expansive, interwoven, material politics in which the political does not become the merely personal. Zwillinger's photos, as they intermesh person, home and wider environment, suggest how MCS requires that we rethink the boundaries of our persons as well as our notions of safety and normalcy. The chemically reactive embody a corporeality that is always already transcorporeal, as they help us to envision the invisible movement of xenobiotic substances across human bodies, built environments and non-human nature. Even as people with MCS engage in various boundary practices in order to create safe spaces,[4] their constant vigilance only demonstrates that ultimately no place is safe. Such a realization recasts human health as a matter of environmental health, as the human is substantially co-extensive with the rest of the world.

Locating Materiality: Venom, Genes and Cultural Theory

The United States National Institute of Environmental Health Sciences website reports that at an environmental health sciences meeting, "there was an old-fashioned debate on MCS and the proponents who believed that it was simply a psychiatric disorder won the debate!" (NIEHS 2005). The "simply" here, not only discounts the testimony of people with MCS, but renders psychological conditions immaterial. It is not surprising that various xenobiotic substances can produce psychological effects, since some of them affect neurological systems. Those who label MCS as a psychiatric condition, however, do so in order to contend that MCS is not a real, physical illness. An article in the *Journal of Psychosomatic Research*, for example, argues that the "only limitation on the types of physical symptoms presented by the patient may be the patient's own imagination and knowledge about physical illnesses" (Ericksen and Ursin 1994: 5). Even though Ericksen and Ursin discuss the neurological mechanisms of sensitization and limbic kindling, which would seem to emphasize the materiality of MCS, they ultimately render MCS and similar conditions immaterial, concluding that there is no point in searching for a "nonexistent organic disease." They even begrudge the patients the term "symptom," preferring to downgrade the phenomena to "complaints" (6, 3). Similarly, an article in *Toxicology Letters*, by Hermann M. Bolt and Ernst Kiesswetter concludes that "MCS is not a conventional toxicological phenomenon," because it is not "the venom of the spider" that causes the effect but, quoting Shakespeare, "the 'infection of the knowledge'" (Bolt and Kiesswetter 2002: 9). This metaphor dispels the materiality of this syndrome by making it a mere mental problem. At the same time, it transforms myriad and diffuse environmental substances which are threatening, in part, because of the profound onto-epistemological problems they pose, into the tangible, distinct figure of the venomous spider. (One can avoid, capture, compassionately relocate, or squash a spider, but how does an individual detect or avoid mercury in the air?)

Dismissing MCS as a mere psychological problem is particularly odd in an age when a rapid increase in the use of psychopharmaceutical drugs jumbles mind/body and mental/material dichotomies. As Nicholas A. Ashford and Claudia Miller put it, patients with MCS whose symptoms have been "attributed to psychiatric causes ... wonder how psychiatrists, who routinely use minute doses of chemicals called *drugs* to effectuate behaviour, fail to recognize that chemicals in the air or foods can impact the brain or cause marked behavioural changes" (1991: 114). The rather cavalier disregard for MCS may be tinged with misogyny; the majority of the chemically reactive are perceived to be mere "complaining" women. Pamela Reed Gibson argues, in fact, that women are more likely to experience the trivialization of their illness by family members, friends, employers, co-workers and physicians. She cites several studies showing that even when men and women suffer from identical conditions, physicians are more likely to dismiss women's symptoms as hysteria or stress (1997: 478). In this instance, it is hardly progressive

to discount the biology of MCS in favour of social constructionist or psychological models. Instead, it makes more sense to consider, along with Elizabeth Wilson, how "feminism can be deeply and happily complicit with biological explanation" (2004: 14).

Not surprisingly, chemical manufacturers fund some of the more dismissive research. According to an article in *Rachel's Environment and Health Weekly*:

> The pesticide corporations have formed their own cigarette-science group called RISE (Responsible Industry for a Sound Environment). RISE is made up of executives from companies like Monsanto, Sandoz Agro, DowElanco, Dupont Agricultural Products, The Scotts Company, and other pesticide manufacturers, formulators, and distributors. (Corporate 1995)

Most notoriously, Dr. Ronald Gots, who provides expert testimony on behalf of industry, contends that MCS is a psychological, not a medical condition, calling it "a peculiar manifestation of our technophobic and chemophobic society'" (qtd. in Corporate 1995). Although Gots implies that irrational technophobic beliefs conjure up MCS, Stanley Caress's epidemiological study reports the contrary. He and his colleagues found that only 1.4 per cent of his subjects "reported experiencing depression, anxiety, or other emotional problems prior to the onset of their hypersensitivity to chemicals" (Caress 2002: 4-5). The study suggests that the "emergence of emotional difficulties subsequent to hypersensitivity could be the result of physical symptoms so disruptive that they produce substantial emotional problems" or, that they could result "from exposure to toxic agents that affect brain functions related to mood and emotions" (5). Similarly, Chris Winder, in a careful, comprehensive review of recent scientific research, explains why the many psychological explanations of autosuggestion, conditioned response, malingering and psychosomatic condition are unlikely. He answers a key question in MCS research—why would some people be affected by such low doses of toxins?—by explaining that "[o]ne of the problems in dealing with toxic material is that if dose-response information is available, it usually refers to high level exposures at the upper end of the relationship, as effects are more likely to be evident" (Winder 2002: 2). He states that the study of "biological effects of low level exposures" is an "important emerging area of toxicology"(2). Chemical companies and other industries, however, are probably not enthusiastic about this emerging area of toxicology, since it directs attention to the pesky demarcation of what is safe from what is harmful. Where science, law and medicine make this demarcation has staggering political, economic, environmental and ethical ramifications. The subtitle of Ashford and Miller's book puts it succinctly: *Low Levels and High Stakes* (1991).

Even though the definition and the mechanisms of EI are still highly debated, genetic studies of this syndrome are underway. Gail McKeown-Eyssen and her colleagues undertook a study to determine "whether there are genetic differences

in xenobiotic metabolism" (2004: 972), in other words, whether people with MCS have significant genetic differences that affect the metabolism of toxic chemicals. Focusing on the CYP2D6 enzyme, "known to activate and inactivate toxins and endogenous neurochemicals," they found that "individuals with higher CYP2D6 activity ... are at increased risk for MCS compared with individuals with two non-functional alleles" (McKeown-Eyssen et al. 2004: 971, 975). They also found that this particular enzyme may interact with another (NAT2) "to substantially increase risk for MCS beyond the risk that is observed for each gene alone"(977). Genetic research on MCS is both promising and perilous. On the positive side, genetic research may help uncover the mechanisms of MCS, which is no small matter. In addition, the current cultural potency of the genome, and its ability to signify what is scientifically deemed to be "real," may help MCS gain wider cultural and medical legitimacy. Such legitimacy may well translate into more research funding and more assistance for the chemically reactive.

However, environmental illness which could potentially breach the medical model of discrete, bounded bodies and encourage a transcorporeal environmental ethic, may be constrained by the double helix of discrete, identifiable entities called genes. Science studies scholars have criticized predominant conceptions of genes as discrete agents, imagined as utterly disconnected from environment.[5] The prevalent discourse of genetic agency may make the environment of environmental illness fade into immateriality. Labelling the chemically reactive as genetically defective places the onus on bad genes, instead of injurious chemical, industrial, military and governmental practices which has many economic, legal and political implications. Giovanna Di Chiro explores a similar scenario in her disturbing essay, "Producing Roundup Ready Communities: Human Genome Research and Environmental Justice Policy" (2004). Di Chiro explains that the Environmental Genome Project plans to catalogue genetic variances that "may render certain populations 'more susceptible to, or more resistant to, substances they may encounter at work, at home, or more generally, in the environment'" (142). As Di Chiro demonstrates, the discourse of this project "assumes we will live with environmental toxins—it naturalizes environmental toxicity and pathologizes some genomic subsets of the human population" (146).

Sara Shostak offers an alternative vision in which genetic research may be less ethically and politically pernicious as well as less reductive:

> [T]he promise of the study of gene-environment interaction is in its direction of scientific, biomedical, and public health attention simultaneously inward, towards the gene/genome and the interior of the body, and outward, towards particular practices, places and the exposures they contain and enable. Insofar as it places the reductionist paradigm of molecular genetics within the context of place, this dual focus helps to elucidate the inextricability of the biological and the social. (2003: 2328)

If the focus of genetic research is simultaneously inward and outward, or in my terms, transcorporeal, it may be able to capture the ways in which the agencies of the body always interact with the substances and agencies of particular places. Thus, genetic research may establish the biomedical processes of MCS even as it indicts particular places, substances, industries and labour practices.

The debate over whether MCS is a psychological or a medical condition is an argument about whether or not this illness is "real." Those who argue MCS is psychosomatic not only conceive of the mind as immaterial, but they sever the psyche, as well as the rest of the person, from the broader environment. Other scientists, such as toxicologists, neurologists, immunologists and genetic researchers, search for the biological mechanisms that would result in intolerance to small doses of toxins. Ironically, while those in science and medicine debate the material existence of EI, some cultural critics, immersed in models of social construction that tend to minimize the productive capacities of materiality, see it as breaking through those paradigms via corporeal agency. EI, in other words, provokes heretical departures from social construction by dramatizing material agency and corporeal modes of knowing.

Michelle Murphy's provocative article, "The 'Elsewhere within Here' and Enviromental Illness or, How to Build Yourself a Body in a Safe Space," admits that

> [n]avigating the political tangles that ensnare writing about an abjected illness like MCS has been tricky, for the tools of social constructivism and cultural studies will not always perform in the interest of those with whom [her] political sympathies lie. (2000: 91)

Murphy explains: "historical and cultural accounts have tended to presuppose that an illness's historicity is inversely proportional to its reality"; thus cultural construction performs a "delegitimizing or 'dematerializing' function" (91). However, she puts forth a constructivist account that "instead of chipping away, affirms the 'materiality'" of MCS (93). For example, she demonstrates the material agencies of bodies and the built environment when she explains their "mutual constitution": "bodies reacting to the environment render it pathogenic, and the environment impinging on bodies renders them ill" (98). Murphy also imagines something akin to what I term transcorporeality when she expands the category of ecology to include "not simply moving from nature to a corporeal scale, but extending from the built environment through the skin" (110). Murphy's superb essay serves as a model for "relentlessly materialist" (119) science studies. Despite her use of the term ecology, however, Murphy does contain most of her analysis within built environments, which risks diminishing the broader ecological ramifications of environmental illness.

Sociologists Kroll-Smith and Floyd, boldly and provocatively emphasize the corporeal agencies of the chemically reactive. They gathered their accounts of MCS via questionnaires, interviews, illness biographies, medical studies and observation of support groups. One of the most compelling aspects of their argument is the extent to which they portray the agency of human bodies. Taking up Ulrich Beck's claim that "'consciousness determines being'" they argue that we should also acknowledge that "somatic states and conditions are shaping consciousness" (Kroll-Smith and Floyd 1997: 10). They posit: "the chemically reactive believe their bodies know things" (132). Moreover, MCS performs a mode of corporeal agency in that "bodies resist being the objects of biomedical theory" (97). Rather than censure this conception of corporeal agency by assuming that it requires a cognizance or intentionality that is incompatible with our notions of the body, we can read it as one particularly compelling instance of a broader understanding of material agencies. In Barad's onto-epistemology, for example, "[b]odies are not objects with inherent boundaries and properties; they are material-discursive phenomena" (2003: 823). Barad draws upon Neils Bohr's definition of phenomena to argue that "phenomena are the ontological inseparability of agentially intra-acting 'components'," explaining that intra-action, unlike "inter-action," denies the "prior existence of independent entities" (815). The bodies of the chemically reactive epitomize this sense of ongoing intra-actions. The agency of these bodies does not fit within humanist models of intentionality, but may be best understood as "'doing/being' in its intra-activity" (827).

Capturing Material Agency

Biographies, autobiographies and personal histories of people with MCS abound. Something more may be at stake here than the creation of community or a sense of validation. Kroll-Smith and Floyd provocatively call MCS a "practical epistemology—a strategy for knowing the world that works to reduce or make manageable a human trouble" (1997: 11). In the absence of medical paradigms that "work" for someone with MCS, these autobiographical sketches, which resemble medical case studies, may serve as the primer for MCS as a practical epistemology. The idea that MCS is a practical epistemology may be extended by way of Andrew Pickering's (1995) model of the "mangle" of scientific practice. Pickering explains that much "of everyday life ... has this character of coping with material agency, agency that comes at us from outside the human realm and that cannot be reduced to anything within that realm" (6). Against a representational model that opposes discourse and material reality, Pickering contends that scientific practice captures material agency. He explains how as "active, intentional beings, scientists tentatively construct some new machine. Then they adopt a passive role, monitoring the performance of the machine to see whatever capture of material agency it might effect" (21). The person with MCS is simultaneously the scientist, actively seeking knowledge about material agencies, and the instrument

capturing those agencies. In the MCS genre, the body becomes akin to a scientific instrument; daily life becomes a sort of experiment: what happens when I go there, breathe that, touch this? In the foreword to Zwillinger's *The Dispossessed*, Gunnar Heuser, MD, writes that the "sensitivities" of people with MCS "in a way constitute very finely tuned instruments which can measure potentially toxic chemicals at very low levels" (Hueser in Zwillinger 1998: 4). As Murphy puts it, for those with EI,

> ...symptoms are not the signs of an underlying disease hidden within the body: symptoms provide those with MCS with material information about the way various dimensions of their body ecologies are interacting. Symptoms are just as much indicators of what is going on in the environment, as they are indicators of health. (2000: 115)

And as Kroll-Smith and Floyd explain, "people with EI experience their bodies as sources of unmediated knowledge; importantly, they act toward that knowledge as if it were rational, that is, legitimate" (1997: 93). Even as I agree with Kroll-Smith and Floyd that the body of someone with MCS is a source of knowledge, I would add that this corporeal experience is simultaneously material and discursive as people seek an understanding of their bodily reactions within an interwoven framework of medicine, law, science, environmentalism and MCS discourses. What stands out, however, is a veritable avalanche of personal, yet baldly factual, accounts. Like other sorts of "toxic discourse" that Lawrence Buell describes, "victims are permitted to reverse roles and claim authority" (2001: 44). Against Buell's argument that "toxic discourse" "is a discourse of allegation or insinuation rather than proof" (48), those with MCS offer up the "proof" of their bodily reactions, in repetitive sequences of cause and effect, effect and cause. For those with MCS, toxins are not, in the first instance, discourses, but transcorporeal substances that provoke illness, pain and disability.

Thus, MCS autobiographies have become a recognizable genre, featuring descriptions of toxins followed by a description of their effects. This sometimes material-metonymic slide between toxic substance and self intimates an emerging ontology in which those with MCS are forced to see themselves as interconnected with their environs. Elizabeth Schuster, for example, tells of walking into a room in which a chemical had been used on the floor: "I had a panic-type reaction because it was one of those chemicals that I can feel moving into my brain and grabbing on, and it won't let go. One that affects me for three, four, five days..." (qtd. in McCormick 2001: 25). Each of Steen Hansen Hviid's paragraph-long "personal stories" of eighteen patients at the Environmental Health Centre in Dallas, details specific physical effects of numerous substances. These accounts can of course only be written after one has concluded that one suffers from MCS, since without that epistemological frame, no one would ever imagine including

such things as copy machines, perfume or insecticides in one's autobiography or medical history.

The most captivating account of MCS comes from Jacob B. Berkson, in his self-published book, *A Canary's Tale* (1996), which documents nine years of life with MCS. He captures the ongoing struggle to make sense of this condition by including many pages of medical, toxicological and air sampling test results as well as discussions with public health officials, allergists, toxicologists, a psychiatrist and a wide range of physicians. The form of this book, especially the extremely brief chapters, dramatizes the confusing, piecemeal, episodic nature of his quest for knowledge. Berkson's minimalist, deadpan, darkly ironic style suggests, in modernist fashion, the lack of moorings within this epistemological struggle. Moorings are swept away in the first few chapters, which question the wisdom of authorities. After documenting his initial suffering, Berkson includes a long excerpt from a Dow Chemical advertisement that touts Dursban as "the worry-free, peace of mind termiticide," assuring the consumer that "you can breathe easy." Berkson ends that chapter by commenting wryly, "If you can't believe Dow Chemical, one of the largest international petrochemical corporations in the world, who can you believe?"(Berkson 1996: 14). He begins the next chapter describing how the community public health officer, an MD, assures him that Dursban is safe. The absurdity rebounds when the same public health officer does not notice that the larger scientific, political and economic context unravels these declarations of safety. The public health officer explains that Dursban is a replacement for Chlordane, which "[t]hey found out was a carcinogen" (16). Although the official notes that Dursban has "only been on the market for a short time"(15), he seems unable to recognize how his guarantee of safety has fallen into an abyss of doubt. What, one wonders, will "they" find out about Dursban? Only time will tell.[6] When Berkson, who is still terribly ill, receives the air sampling report on his house, which cost him more than a thousand dollars, he concludes this brief chapter, his dark irony intact: "The good news was that I now had a written report from scientific experts who had sampled the air and concluded that the house was safe" (45).

Despite his razor-sharp critique of industry, science and the medical establishment, Berkson continues to chase down a diagnosis, consulting, as he puts it, "an internist, gastroenterologist, psychiatrist, urologist, otolaryngologist, and a partridge in a pear tree" (87). He must contend not only with a variety of misdiagnoses, but with the absurd moments that can result when a layperson tries to decipher medical discourse. When, for example, he had been diagnosed with "campylobacter pylori," he looks up the definition only to find that it is a venereal disease of cattle: "I knew damn well I had not been having sex with any goddamn sheep or cow" (88). He had read the wrong "campylobacter" definition. Despite these difficulties, Berkson persists in tracking down more information about MCS. The quest for knowledge and information drives this narrative: what began as a personal story ends up

being a compendium of information about pollution, environmentally-induced disease, the legal status of MCS, sick building syndrome, Gulf War syndrome and other environmental struggles. In fact, volume II of *A Canary's Tale* is a 150-page bibliography not only on MCS, but on pollution, environmental public policy, and a political "call to action." Although Berkson writes in a distinctive voice, one learns little about him because his personal account extends into a vast network of knowledge, power and activism. The book is full of long quotations from books, magazines, scientific essays and his own medical records. *A Canary's Tale* may well be the *Moby Dick* of MCS, in that it dramatizes a passionate, sometimes ironic, epistemological quest in an experimental form. Even as Berkson learns from his own corporeal reactions and the accounts of others, and even as he must contend with the ignorance or disbelief of many a medical professional, the point of his quest is not simply to critique science and medicine, but to get to the truth of the matter. Berkson seeks to add "reality to matters of fact and not subtract reality" (Latour 2004: 232). Berkson needs scientific information to help him navigate his daily life. As Ulrich Beck explains, within a risk society, "the extent and the symptoms of people's endangerment are fundamentally *dependent on external knowledge*" (1992: 53). Yet Beck's paradigm works only partially for those with MCS, since the need for external knowledge is inextricably intertwined with the ongoing experience of one's own body as it captures the agencies of the material world, a world that always "intra-acts" with one's emerging, corporeal self.

Berkson's quest for knowledge expands, as domestic space, ordinary consumer practices, non-human natures and human bodies intermingle. He realizes, for example, that it would be a mistake to consider his own health as a matter solely within the domain of the human. When a toxicologist tells him that Dursban is a cholinesterase inhibitor and that "[c]holinesterase is some kind of enzyme that is essential for the nervous system to work properly" (Berkson 1996: 36), he responds: "She seemed to be saying that termites and people are reliant upon the same—cholinesterase—for the health of the nervous system" (37). This may be no surprise to a biologist, but for an ordinary consumer who can't imagine life without pesticides it is an astounding discovery. Realizing that one's own biological substance is not unlike that of a termite thrusts one into a trans-corporeal dissonance. It is no surprise then that Berkson sees environmental illness as a phenomenon that demands not only more scientific and medical knowledge but more environmentally oriented policies and practices.

Berkson's desire to figure out his own debilitating corporeal condition expands into a vast environmental-health manifesto. *Detoxify or Die* by Sherry Rogers, MD, moves in the opposite direction: she casts environmental illness as a nearly universal condition but ultimately shrinks the solution to this crisis down to the size of a pill. Arguing that "environmental toxins cause all human disease" Rogers catalogues how various toxins cause specific problems, such as "[c]admium accumulation from seafood, dental work, or auto and incinerator exhausts can

trigger osteoporosis, back pain, high blood pressure, hip pain, arthritis, kidney disease, BPH, chronic fatigue, [and] cancer" (2002: 89, 90). A thoroughly environmental corporeality emerges from this account: bodies are not self-contained units; all are permeable, accumulating the various toxins that emanate from innumerable sources. The devastating critique of the medical, pharmaceutical and chemical industries proffered by this universalizing account of MCS is, unfortunately, tamed by its quasi-religious solutions. Rogers advocates an expensive detoxification regimen whereby one purchases a shelf-full of antioxidants and phytonutrients that were, in her discourse, *specially created by God himself* to save us from industrialized society. It is an odd theology, indeed, in which the rather unpoetic antioxidant Glutathione becomes the means of salvation. Even though Rogers cites the statistic that "27 per cent of dead whales recovered from the St. Lawrence River ... have cancer," which is the same percentage as that for humans, proving that "we are all a product of our polluted environment" (315), she does not consider that the "Detoxify or Die" solution is worthless for wild creatures, since they can purchase neither her book nor massive amounts of glutathione. Indeed, the individualistic and consumerist solution she offers is sublimated into a digital theology, as she concludes with her hope that the book has given "you a small appreciation for the magnificence of the natural, God-given healing capability that has been programmed into you" (315). The "you," here, is born of a digitized Genesis, not an ongoing evolutionary process in which species emerge from ongoing intra-actions with their environment.

Environmental illness provides a potent site from which to reconceptualize human corporeality as coextensive with non-human nature. Emerging models of material agency, especially those of Andrew Pickering (1995) and Karen Barad (2003), offer compelling posthumanist models for reconceiving both corporeality and non-human nature. We all inhabit the "mangle of practice" in Pickering's terms, and we are all, according to Barad, "particular material (re)configurings of the world with shifting boundaries and properties that stabilize and destabilize along with specific material changes" (2003: 818). These complex accounts of material agency serve as an antidote to Rogers's revelation of ostensibly detached, stable substances that will save us from the world. Indeed, environmental illness provokes a conception of material agency that is as confounding as that of Barad's theory, in which there are, ultimately, no separate "things," in that all matter intra-acts in the ongoing "differential mattering" of the world (817). A material ethics may emerge from this transcorporeal space—an ethics that is centred neither in individual humans nor in the imagining of a pristine nature, but instead in the flows and interchanges between them.

Inhabiting transcorporeality as an environmentalist practice may risk reinstating a new form of anthropocentrism, in that human bodies and human health remain matters of concern. Tracing the transit across human bodies, however, positions people on just one side of the picture—not front and centre, but on

the edge, coextensive with natural-cultural environments that are certainly not, in Joy Williams's term, "bloodless" (2002: 5). Indeed, I hope that a palpable and profound sense of immersion within a shared world of ecosystems, climate change, microorganisms, plants, animals, (xenobiotic) substances and material agencies will continue to provoke new forms of environmental ethics and activism that will be accountable to the more-than-human world. Reckoning with how nature can or should "matter" may itself be an entirely human endeavour. And yet these discussions have the potential to challenge our very conception of the human by recasting us as one of many creatures who find ourselves to be inseparable from the very stuff of the risky, emergent and lively world.

Notes

I would like to thank Catriona Mortimer-Sandilands and Megan Salhus for inviting me to speak at the Nature Matters conference. I deeply regret that a broken ankle kept me from participating in this important event. I would also like to thank the anonymous readers of *TOPIA* for the many helpful and thought-provoking comments on this piece.

1. For a more extensive discussion of emerging models of materiality in a range of disciplines, see my introductory chapter to *Bodily Natures: Science, Environment, and the Human Self*. See also the introduction to *Material Feminisms* (2008), written by Susan Hekman and me, as well as the many fine essays within that volume.

2. "Intra-act" is Karen Barad's term, derived from the work of Neils Bohrs. Barad insists upon "intra-action," rather than "interaction," in order to emphasize that the world is a dynamic, open process that produces phenomena. In other words, the concept of intra-action radically departs from models of interaction, in that it does not assume the existence of separate entities. Instead, everything is emergent.

3. William Rea defines "Total Toxic (Body) Load (Burden)" as "the sum of all pollutants in the body at one time." In his theory, toxic load is important because when "this accumulation overloads the system, chemical sensitivity can occur" (Rea 1992: 12).

4. See, for example, Fiona Coyle's study of how eighteen Canadian women address the "corporeal chaos" of MCS by practising a "spatial and bodily regime that entails the reconstruction of everyday environments into safe spaces" (Coyle 2004: 72).

5. See the work of Evelyn Fox Keller, Donna Haraway, Richard Lewontin and Susan Oyama.

6. Time can be bought and sold, as the article "Corporate Manipulation of Scientific Evidence Linking Chemical Exposures to Human Disease" attests:

> As the scientific evidence piles up, linking chemical exposures to serious human diseases, many chemical-dependent industries, such as pesticide purveyors, are searching for a strategy to buy themselves some time, to put off the inevitable. They needn't look far. The tobacco industry has demonstrated that 40 years of scientific bad news can be deflected and neutralized with relative ease. (1995)

References

Alaimo, Stacy. N.p. *Bodily Natures: Science, Environmenat, and the Material Self*.

Alaimo, Stacy and Susan J. Hekman, eds. 2008. *Material Feminisms*. Bloomington, IN: Indiana University Press.

Ashford, Nicholas A. and Claudia S. Miller. 1991. *Chemical Exposures: Low Levels and High Stakes*. New York: Van Nostrand Reinhold.

Barad, Karen. 2001. Reconfiguring Space, Time, and Matter. In *Feminist Locations: Global and Local, Theory and Practice*, edited by Marianne DeKoven, 75-109. New Brunswick, NJ: Rutgers University Press.

———. 2003. Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter. *SIGNS* 28(3): 801-31.

Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. London: Sage.

Berkson, Jacob B. 1996. *A Canary's Tale: The Final Battle: Politics, Poisons, and Pollution vs. The Environment and the Public Health*, vols. I and II. Hagerstown, MD: Jacob B. Berkson.

Bolt, Hermann M. and Ernst Kiesswetter. 2002. Is Multiple Chemical Sensitivity a Clinically Defined Entity? *Toxicology Letters* 128(March): 99-106.

Buell, Lawrence. 2001. *Writing for an Endangered World: Literature, Culture, and Environment in the U.S and Beyond.* Cambridge, MA: Harvard University Press.

Caress, Stanley, et al. 2002. Symptomology and Etiology of Multiple Chemical Sensitivities in the Southeastern United States. *Archives of Environmental Health* 57.5 (September/October): 429-37.

Corporate Manipulation of Scientific Evidence Linking Chemical Exposures to Human Disease: A Case in Point—Cigarette Science at Johns Hopkins. 1995. *Rachel's Environment & Health Weekly*, 19 October. http://consumerlawpage.com/article/chemical.shtml.

Coyle, Fiona. 2004. Safe Space as Counter Space: Women, Environmental Illness and "Corporeal Chaos." *The Canadian Geographer* 48(1): 62-75.

Di Chiro, Giovanna. 2004. Producing "Roundup Ready" Communities? Human Genome Research and Environmental Justice Policy. In *New Perspectives on Environmental Justice: Gender, Sexuality, and Activism*, edited by Rachel Stein, 139-60. New Brunswick, NJ: Rutgers University Press.

Eaton, K., et al. 2000. Multiple Chemical Sensitivity: Recognition and Management. A Document on the Health Effects of Everyday Chemical Exposures and their Limitations. *Journal of Nutritional & Environmental Medicine* 10(1): 39-84.

Environmental Health Centre of Dallas. http://www.ehcd.com/services/patientsservices. Accessed 18 October 2004.

Ericksen, H. R. and H. Ursin. 1994. Subjective Health Complaints, Sensitization, and Sustained Cognitive Activation (Stress). *Journal of Psychosomatic Research* 56(4): 445-48.

Gibson, Pamela Reed. 1997. Multiple Chemical Sensitivity, Culture, and Deligitimazation: A Feminist Analysis. *Feminism and Psychology* 7(4): 475-93.

Hansen Hviid, Stenn. 2005. Personal Stories from Environmentally Ill Patients around the Environmental Health Centre in Dallas. http://www.ehcd.com/patient_stories/stories.html. Accessed 29 May 2004.

Haraway, Donna. 1997. *Modest_Witness@Second_Millenium. FemaleMan_Meets_Oncomouse*. New York: Routledge.

Hausteiner, Constanze, et. al. 2003. Psychiatric Morbidity and Low Self-Attentiveness in Patients with Environmental Illness. *Journal of Nervous and Mental Disease* 191(1): 50-55.

Heavey, David. 1997. The Enfreakment of Photography. In *Disability Studies Reader,* edited by Lennard J. Davis, 332-47. New York: Routledge.

Keller, Evelyn Fox. 2002. *The Century of the Gene*. Cambridge: Harvard University Press.

Kroll-Smith, Steve and H. Hugh Floyd. 1997. *Bodies in Protest: Environmental Illness and the Struggle over Medical Knowledge*. New York: New York University Press.

Latour, Bruno. 2004. Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry* 30(Winter): 225-48.

Lewontin, Richard. 2002. *The Triple Helix: Gene, Organism, and Environment*. Cambridge, MA: Harvard University Press.

McCormick, Gail. 2001. *Living with Multiple Chemical Sensitivity: Narratives of Coping*. Jefferson, NC: McFarland and Company.

McKeown-Eyssen, Gail, et al. 2004. Case-Control Study of Genotypes in Multiple Chemical Sensitivity: CYP2D6, NAT1, NAT2, PON1, PON2 AND MTHFR. *International Journal of Epidemiology* 33:971-78.

Murphy, Michelle. 2000. The "Elsewhere within Here" and Environmental Illness; or How to Build a Yourself a Body in a Safe Space. *Configurations* 8:87-120.

National Institute of Environmental Health Sciences. http://www.niehs.nih.gov/external/faq/mcss.html. Accessed 18 September 2005.

Oyama, Susan. 2000. *The Ontogeny of Information: Developmental Systems and Evolution*. Durham, NC: Duke.

Pall, Martin L. 2002. NMDA Sensitization and Stimulation by Peroxynitrite, Nitric Oxide, and Organic Solvents as the Mechanism of Chemical Sensitivity in Multiple Chemical Sensitivity. *The FASEB Journal* 16:1407-17.

Pickering, Andrew. 1995. *The Mangle of Practice: Time, Agency, and Science*. Chicago, IL: University of Chicago Press.

Radetsky, Peter. 1997. *Allergic to the Twentieth Century: The Explosion in Environmental Allergies—From Sick Buildings to Multiple Chemical Sensitivity.* Boston: Little, Brown and Company.

Rea, William. 1992. *Chemical Sensitivity*. Vol. I. Boca Raton, FL: Lewis Publishers.

Rogers, Sherry. 2002. *Detoxify or Die*. Sarasota, FL: Sand Key Company.

Shostak, Sara. 2003. Locating Gene-Environment Interaction: At the Intersections of Genetics and Public Health. *Social Science and Medicine* 56:2327-42.

Sontag, Susan. 1977 [1988]. *Illness as Metaphor & Aids and Its Metaphors*. New York: *Doubleday*.

Strubbe Wittenberg, Janice. 1996. *The Rebellious Body: Reclaim Your Life from Environmental Illness or Chronic Fatigue Syndrome*. New York: Insight Books.

Williams, Joy. 2002. *Ill Nature.* New York: Vintage.

Wilson, Elizabeth. 2004. *Psychosomatic: Feminism and the Neurological Body*. Durham, NC: Duke University Press.

Winder, Chris. 2002. Mechanisms of Multiple Chemical Sensitivity. *Toxicology Letters* 128(1-3): 85-97.

Zwillinger, Rhonda. 1998. *The Dispossessed: Living with Multiple Chemical Sensitivities.* Paulden, AZ: The Dispossessed Project.

Canadian Journal of Cultural Studies